

WHAT IS CLAIMED IS:

1. A circular cutter unit for cutting flat lengths of material such as sheet metal in a horizontal plane (10) comprising

upper and lower circular blades (2, 4) lying in planes substantially perpendicular to the horizontal plane (10) and parallel with a longitudinal direction (8) of the material;

upper and lower blade shafts respectively supporting said upper and lower blades, said shafts extending (1, 3) parallel with said horizontal plane (10) and perpendicular to said longitudinal direction (8);

a non-positive drive connection between said blade shafts;

a frame (5) having substantially a U-shape with upper and lower legs (51, 52) interconnected by a flat yoke (53) intersecting said horizontal plane (10) at an acute angle,

means for rotatably supporting said upper and lower blade shafts respectively in said upper and lower legs;

means for establishing and adjusting a cutting gap between said two circular blades (2, 4);

means for releasably coupling said cutter unit to a driving unit having a motor; and

means for non-positively connecting one of said two circular blades to said motor of said driving unit.

2. A circular cutter unit according to claim 1 wherein

*ad to*  
2 said cutting gap is adjustable between about 0.005 mm and about  
3 0.030 mm.

*Sub B7*  
3. A circular cutter unit according to claim 1 wherein  
said means for non-positively connecting one of said blades is  
connected to said lower blade.

*B*  
1 4. A circular cutter unit according to claim 1 wherein  
2 said means for non-positively connecting one of said two circular  
3 blades comprises a toothed wheel (18).

*Sub B8*  
5. A circular cutter unit according to claim 1 wherein  
said non-positive drive connection between said blade shafts  
comprises a friction drive.

*C*  
1 6. A circular cutter unit according to claim 1 and further  
2 comprising means for displaceably mounting said frame (5) for  
3 movement perpendicular to said longitudinal direction (8), said  
4 means for displaceably mounting including at least one guide rail  
5 (6) extending parallel with said blade shafts (1, 3).

*Sub B9*  
1 7. A circular cutter unit according to claim 6 wherein  
2 said upper blade shaft (1) is supported in an axially  
3 displaceable bush (13) mounted in said upper leg (51) of said  
4 frame (5).

*C*  
1 8. A circular cutter unit according to claim 7 wherein  
2 said cutting gap between said two circular blades (2, 4) is

*ad to a*  
B 3 adjustable ~~within the~~ range of 0.01 to 0.020 mm.

1 9. A circular cutter unit according to claim 8 wherein  
2 said gap has a width in the range of 0.15 to 0.4 mm.

*Sub B97*  
2 10. A circular cutter unit according to claim 9 wherein  
3 said upper and lower shafts support said circular blades at a  
cutting angle in the range of 6 to 8°.

C 1 11. A circular cutter unit according to claim 10 wherein  
2 each of said blade shafts (1, 3) has a diameter of less than 25  
3 mm.

C 1 12. A circular cutter unit according to claim 11 wherein  
2 said acute angle at which said flat yoke (53) intersects said AB  
3 horizontal plane (10) is in the range of 8 to 12°.

1 13. A circular cutting unit according to claim 12 and  
2 further comprising a drive shaft engaging and directly driving  
3 said lower circular blade and gear means driving said upper  
4 circular blade (2) from said lower circular blade.

C 1 14. A circular cutter unit according to claim 1 wherein  
2 said *circular* blades have *cutting* edges *overlapping* radially by a distance  
3 in the range of 0.18 to 0.23 mm.

C 1 15. A circular cutter unit according to claim 14 wherein  
2 said upper and lower *blade* shafts support said circular blades at a

<sup>a</sup>  
3 cutting angle in ~~the~~ range of 6.5 to 7.5°.

<sup>10</sup>  
1 <sup>11</sup>16. A circular cutter unit according to claim <sup>10</sup>15 wherein  
2 each of said blade shafts (1, 3) has a diameter of less than 20  
3 mm.

<sup>11</sup>  
1 <sup>12</sup>17. A circular cutter unit according to claim <sup>11</sup>16 wherein  
2 said acute angle at which said flat yoke (53) intersects (said  
3 horizontal plane) (10) is in <sup>a</sup>the range of 9 to 11°.

<sup>Sub B10</sup>  
2 18. An apparatus for cutting flat lengths of sheet metal in  
a generally horizontal plane including

3 a plurality of circular cutting units each comprising

4 upper and lower circular blades (2, 4) lying in planes  
5 substantially perpendicular to the horizontal plane (10) and  
6 parallel with a longitudinal direction (8) of the material,

7 upper and lower blade shafts respectively supporting said  
8 upper and lower blades, said shafts extending (1, 3)  
9 parallel with said horizontal plane (10) and perpendicular  
10 to said longitudinal direction (8),

11 a non-positive drive connection between said blade shafts;

12 a frame (5) having substantially a U-shape with upper and  
13 lower legs (51, 52) interconnected by a flat yoke (53)  
14 intersecting said horizontal plane (10) at an acute angle,

15 means for rotatably supporting said upper and lower blade  
16 shafts respectively in said upper and lower legs, and

17 means for establishing and adjusting a cutting gap between  
18 said two circular blades (2, 4);

19 means for releasably coupling each said cutter unit to a driving  
20 unit having a motor whereby each said cutter unit can be released  
21 from said apparatus independently of each other cutting unit;

22 a plurality of parallel guide rails extending perpendicular to  
23 said longitudinal direction; and

24 means on each of said frames slidable engaging said guide rails  
25 so that each of said circular cutter units is independently  
26 positionable along said rails.

1 <sup>14</sup> 19. An apparatus according to claim <sup>13</sup> 18 wherein said means  
2 for establishing and adjusting said gap ~~is capable of setting~~  
3 said gap to a width between 0.005 mm and 0.030 mm.

*Sub B 11*  
1 20. An apparatus according to claim 18 wherein said  
2 circular cutting units (14, 15) are mounted on said guide rails  
3 (6) with said circular cutting blades thereof oriented in the  
4 same direction.

ADD  
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A1